0002

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

January 12, 2007

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

THRU: Dana Dean and Wayne Western, Co-leads

FROM: James D. Smith, Environmental Scientist JDS 01/25/07

RE: Lila Canyon Extension, UtahAmerican Energy, Inc., Horse Canyon Mine, C/007/0013, Task ID #2708

SUMMARY:

Permittee's Action	Date received	DOGM's Action	
Original submittal	02/11/2002	Designated as PM02B (Task # 23)	
		Determined Administratively Complete	02/25/2002
Published	Feb – Mar 2002		
		TA ("informal")	03/26/2002
		Informal Conference	04/21/2002
Response to TA	04/24/2002	Designated as PM02B-1 (Task # 1411)	
		Tech Memo – Hydrology	07/29/2002
		TA	07/19/2002
Response to TA	12/06/2002	Designated as PM02B-2 (Task # 1348)	
		Tech Memo – Hydrology	03/31/2003
		TA	04/09/2003
Response to TA	02/26/2004	Designated as Task # 1859	02/26/2004
		Determined Administratively Complete	03/26/2004
Published	Apr 2004		
		Tech Memo - Hydrology	06/11/2004

		TA	06/15/2004
		Informal Conference before Lowell Braxton	07/07/2004
		Simplification of TA - Designated as Task # 2055	10/26/2004
		Tech Memo - Hydrology (not finalized)	11/12/2004
		TA	11/30/2004
Response to TA	02/25/2005	Designated as Task # 2159	
		Tech Memo - Hydrology	05/13/2005
		Deficiency letter	05/20/2005
Response to TA	06/15/2005	Designated as Task # 2275	
		Tech Memo - Hydrology	08/19/2005
Response to Deficiency Letter	08/25/2005	Designated as Task # 2304	
Received additional information	09/19/2005		
Received updated Chapter 7	09/21/2005	TA	09/21/2005
[Request from SUWA for an Informal Conference]	10/11/2005		
Received additional information	10/13/2005		
Received additional information	10/31/2005		
		Informal Conference	11/08/2005
		Deficiency letter	11/23/2005
Response to Deficiency Letter	12/09/2005		
		Request for redline – strikeout version	12/19/2005
Received additional information	12/20/2005 12/22/2005 12/23/2005 12/30/2005 01/09/2006		
Meeting to discuss needs for further revisions	01/12/2006		
Meeting to discuss needs for further revisions	01/20/2006		
Received additional information from 01/12 and 01/20 meetings	01/30/2006	Closed Task # 2304 and created Task # 2421 to track revisions to TA.	01/30/2006

Received CD of entire plan (except for a few plates).	02/06/2006		
Received additional information	02/09/2006	Tech Memo – Geology and Hydrology	02/10/2006
		"Supplemental Technical Information & Clarifications Required" letter	11/27/2006
Response to "Supplemental Technical Information & Clarifications Required" letter	12/01/2006	Designated as Task #2708	
Received additional information	12/06/2006 12/15/2006	Tech Memo – Geology and Hydrology	01/12//2007

The Lila Canyon Extension Permit Application Package (MRP - Part B) has been submitted and reviewed as an extension to the existing Horse Canyon Mine Mining and Reclamation Plan (MRP - Part A). The current Horse Canyon Mine permit area contains approximately 1,330 acres, and the Lila Canyon extension contains approximately 4,700 acres for a total of 6,030 acres.

The Permittee, UtahAmerican Energy, Inc. (UEI), has proposed to develop new surface facilities near the mouth of Lila Canyon in order to mine coal in six federal leases. The federal leases are contained within the "North Block Logical Mining Unit" as approved by the BLM on January 1, 1994.

The disturbed area for the old Horse Canyon Mine operations was about 74 acres. On February 25, 2004 the Division gave final approval to a change in post-mining land use on 16.18 disturbed but unreclaimed acres plus some undisturbed acreage. In October 2005 the Permittee donated the land and structures, including the Horse Canyon Well, to the College of Eastern Utah (CEU) for use as a science field camp for Utah universities. Ownership maps and descriptions in the MRP have been updated to show this change. The remainder of the disturbed area is in Phase 3 reclamation.

The Lila Canyon Extension Permit Application is a Significant Permit Revision, so publication of a notice for public comment was required. Because of the long time period between the Division's April 2003 TA and the Permittee's February 2004 response, the Division considered the permit application to have become inactive and required the applicant to publish a second time, which was done in April 2004.

The Southern Utah Wilderness Alliance (SUWA) identified a number of issues during an Informal Conference held April 21, 2002. The Permittee did not attempt to address those issues in the April 24, 2002 submittal. The Division's July 2002 TA included comments on SUWA's

concerns, and the Findings sections identified some additional information needed in consideration of some of SUWA's concerns. On March 3, 2005, the Permittee submitted a letter specifically addressing SUWA's comments.

The Division prepared a TA, dated September 21, 2005, in which no deficiencies were identified; however, the Division did not issue a permit at that time. In October 2005, SUWA requested another Informal Conference, and that conference was opened November 8, 2005. Although hydrology and geology concerns presented during the Informal Conference do not appear to be substantive from the Division's point of view, the Division prepared a deficiency letter requiring the Permittee to clarify some parts of the MRP - Part B and to provide some additional information. The Permittee responded with a series of submittals that were collectively identified as Task # 2421.

After further consultation between the Division and Division's legal council and the Permittee with their legal council and consultants, the Division sent the Permittee a letter titled "Supplemental Technical Information & Clarifications Required" on November 27, 2006. On December 1, 2006, the Permittee responded to deficiencies identified in that letter and subsequently submitted supplemental information for Chapters 4 and 7. This material is the focus of this Tech Memo.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

Tom Suchoski's professional qualifications are included in Appendix 1-5.

With one exception, the names of those who initialed the Lila Mine Site Water Monitoring reports and Ephemeral-Intermittent Washes Water Monitoring reports in Appendix 7-1 are listed at the end of that appendix. The initials D. V. appear at 01/10/02 and D. V. is not identified; the observed value is no-flow: the identification of the person making this single observation should be in the MRP but it is not critical information. All other observations listed were made by R. Jay Marshall, Tom Paluso, or Mel Coonrod, whose qualifications are in Appendix 1-5. Some observations include the initials of a second observer, who is also identified at the end of Appendix 7-1.

Findings

Reporting of Technical Data is adequate to meet the requirements of the Coal Mining Rules.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Drill-logs in Appendix 6-1 note the presence of visible pyrite, indicating some acid-forming potential in strata above and below the Sunnyside Seam, but strata in the Book Cliffs characteristically have high neutralization potentials and are not acid- or toxic-forming.

Appendix 6-2 contains results of analyses for acid- and toxic-forming materials. The IPA data are from within the Lila Canyon Extension, and the BXG and Kaiser Coal Co. data (ACZ Inc.) bracket the area on the north and south. There are also analyses of material from the old Horse Canyon Mine waste rock pile. These analyses indicate little acid-forming material is present. Overall, acid/base potential is high. Several boron and selenium values were marginally high.

Rock materials are similar to those found in other mines along the Book Cliffs (Sections 731.111 and 731.121). There has been a small amount of acid-drainage at the base of the Sunnyside Mine refuse pile (Section 6.5.5.1), but coal mines in the Book Cliffs have not produced acid or toxic problems. Based on the current knowledge of the acid- and toxic-forming potential of these earth materials, the Permittee should be able to handle them in a manner that minimizes the formation of acid- or toxic-forming drainage or infiltration and otherwise prevents water pollution, and will allow reclamation as planned.

Findings:

The Geologic Resources Information is sufficient to meet the requirements of the Coal Mining Rules.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline Information

Surface-water Information

Appendix 7-10 contains simulated hydrographs based on 6-hour and 24-hour precipitation events with periods of return of 2, 5, 10, 25, 50, and 100 years. Results are shown in tabular and graphic formats. Both small, individual watersheds and combined watersheds were modeled. The drainage basins that were evaluated are shown on Figure 1 of Appendix 7-10. The simulation was conducted using a program that is based on the NRCS unit hydrograph method.

These runoff simulations indicate that for short duration events with recurrence intervals of 5 years or less, there is typically little or no runoff from the watersheds. Thunderstorms are typically localized, so watersheds are not affected equally, and even within a single watershed, precipitation and runoff can be uneven. In addition, infiltration and evapotranspiration reduce or eliminate runoff and streamflow (Sections 724.200 and 726, Appendix 7-9).

Cross-section 2+00, 4+00, 6+00 on Plates 5-7A-1 and 5-7A-2 illustrate the water levels and extent of inundation that could be expected in Lila Wash from a 100-year storm event. These cross sections also show that there is no operation is planned for the channel or flood plain of Lila Wash.

Ground-water Information

Water-quality data from the adjacent Horse Canyon Mine and S-32, which are in the MRP - Part B (Appendices 6-1 and 7-2) and Part A (Appendix VI-1), are adequate to describe the water quality in the Blackhawk Formation (Lower Zone) and meet the requirements of the Coal Mining Rules. The same lower Blackhawk coal zone that was mined at the Horse Canyon Mine will be developed in the Lila Canyon Extension. The new Lila Canyon workings will not connect with the old Horse Canyon workings; however, the two sets of workings will be in close proximity. Water quality in the Lila Canyon Extension is expected to be similar to that in the Horse Canyon Mine (Section 724.100; Appendix 7-3). Data from S-32, located south of the Lila Canyon Extension, in Appendix 6-1 also help characterize the water in the lower Blackhawk coal and adjacent strata.

Findings:

Hydrologic Resource Information is sufficient to meet the requirements of the Coal Mining Rules. However, in order to prevent confusion or misunderstanding by those not familiar with the plan, at some time the Permittee needs to address the one following item:

R645-301-724.100, Pages VII-30, -32, and -34 of the Kaiser Steel water quality information for S-32 are missing from Appendix 6-1. The Permittee needs to include those pages in the MRP.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Coal Resource and Geologic Information Maps

As requested by the Division, the Permittee has projected the IPA piezometers onto the cross-section on Figure 7-1. The surface elevations of the piezometers do not match the surface elevations along the section, so elevations of features do not match in detail, but this indicates the relationship of the piezometers to the strata and potentiometric surface depicted on this cross-section.

As requested by the Division, Vertical Exaggeration has been added to Figure 7-1. Unfortunately, the ratio shown, 1 V: 0.5 H, is not correct. The horizontal scale is given as 1 in = 500 ft and the graphic vertical scale is approximately 1.1 in = 500 ft, making the vertical to horizontal ratio closer to 1 V:0.91 H. (The vertical scale on Figure 7-1 has changed slightly from the previous submittal, in which the vertical scale on this figure was very close to 1 in = 500 ft., giving a ratio of approximately 1 V: 1 H).

Of course, it may be that the horizontal scale is not really 1 in = 500 ft. Comparing the length of the cross-section on Plate 7-1 with the length of Figure 7-1, and the spacing of the IPA piezometers on Figure 7-1 with their east to west separation on Plate 7-1, the horizontal scale on Figure 7-1 seems to be more on the order of 1 in = 1,000 ft. The Permittee needs to correct either the Vertical Exaggeration notation or the Horizontal Scale notation, or both, as they make this figure inaccurate and confusing.

As requested by the Division, the location of the Figure 7-1 cross-section has been added to Plate 7-1.

Subsurface Water Resource Maps

As requested by the Division, Figure 7-1 and Plate 7-1 now show the same location for where the mine workings are projected to intercept the potentiometric surface of the lower saturated zone, at an elevation of approximately 5,900 ft. Unfortunately, now that an effort has been made to reconcile Plate 7-1 with Figure 7-1, it is evident that the cross section in Figure 7-1 is a conceptual drawing, not a cross section that can be referenced to Plate 7-1.

- The line depicting the coal water contact on the previous version of Plate 7-1 correlated with the coal and potentiometric surface contour lines; the new version ignores the contour values and the water level in the Horse Canyon Mine sump in order to force a fit with Figure 7-1.
- The topography and geology on Figure 7-1 do not match those on Plate 7-1.

The easiest solution to these inconsistencies is to remove the projections of the IPA piezometers from Figure 7-1 and add a statement that clarifies the cross-section is conceptual, rather than an accurate, scaled representation of a specific cross-section of the Lila Canyon Extension. This also ties to the horizontal to vertical scale inconsistencies, as the cross section apparently really isn't to a specific scale.

The line showing the location of the Figure 7-1 cross section needs to be removed from Plate 7-1. The coal water contact on Plate 7-1 should also be depicted so that it ties to the coal elevation and potentiometric surface contour lines, in other words moved back to where it was before this latest revision.

As requested by the Division, the Permittee has included a portrayal of the upper saturated zone on Figure 7-1. This is not a precise representation of any specific perched aquifer, but is rather a portrayal of the general concept of the saturated strata of the upper zone that are isolated from the lower saturated zone, which also indicated on Figure 7-1 by the potentiometric surface.

Findings:

Maps, Plans, and Cross Sections of Resource Information is sufficient to meet the requirements of the Coal Mining Rules. However, at some time the Permittee needs to address several items on these figures that could cause confusion or misunderstanding by those not familiar with the plan:

R645-301-121.120, -542.710, -731.760, The Permittee needs to redo the cross section on Figure 7-1 so that it is accurate and agrees with information on the maps on Plates 6-1 and 7-1. The corrections must include the following:

1. The horizontal scale and vertical exaggeration need to be accurate and to scale with Plate 7-1;
2. The topography needs to match the topography on Plate 7-1;

3. The surface geology needs to match that on Plate 6-1;
4. Dip and thickness of geologic units need to correlate with the cross section vertical exaggeration and information on the maps;
5. The location of the coal/potentiometric surface contact needs to match be accurately depicted, generally corresponding with the data on Plate 7-1; and
6. The projections of the IPA piezometers need to be removed or projected taking surface elevations and strike of the strata into account.

R645-301-121.120, -542.710, -731.760, The Permittee needs to remove the projections of the IPA piezometers from Figure 7-1; however, the conceptual "Typical Perched Saturated Zone" depictions should be retained.

R645-301-121.120, -542.710, -731.760, The Permittee needs to clarify that the horizontal and vertical scales on Figure 7-1 are for approximate reference only, and the horizontal to vertical relationships are not an accurate, representation of a specific cross-section of the Lila Canyon Extension that was scaled from a map.

R645-301-121.120, -542.710, -731.760, The Permittee needs to remove the line showing the location of the Figure 7-1 cross section from Plate 7-1.

R645-301-121.120, -542.710, -731.760, The coal – potentiometric surface water contact on Plate 7-1 needs to be depicted so that it correlates with the coal elevation and potentiometric surface contour lines and ties to the water elevation at the Horse Canyon Mine car dump: in other words, it needs to be moved back to where it was before this latest revision.

R645-301-121.120, The Permittee needs to clarify the Legend panel on Plate 7-1 and reconcile it with the map.

1. Water rights are not indicated in the Legend, yet water rights are shown on the map.
2. Water right numbers are used to identify some surface-water monitoring locations and springs; the IDs for these sites need to consistent with those used throughout the rest of the plan.
3. Some water -right numbers are black, others green. Some spring symbols are green, others blue. Resolving points 1 and 2 may take care of this; otherwise, these distinctions need to be clarified in the Legend.
4. Surface water monitoring site L-18-S is a red dot, and the other surface-water monitoring points are stars. If there is a difference, it needs to be clarified; otherwise, the same symbol should be used for all similar sites.
5. Some water right numbers and water monitoring sites are printed on top of each other or obscured by other text so they are difficult and at times impossible to read. The Permittee needs to make all spring and seep and water right IDs legible.

R645-301-121.120, The Permittee needs to clarify the Legend panel on Plate 6-1 and reconcile it with the map.

1. Surface water monitoring site are shown by both red stars and red dots. If there is a difference, it needs to be clarified; otherwise, the same symbol should be used for all similar sites.
2. The symbol and text for seeps L-16-G and L-17-G need to match the other seeps and springs. These two seeps are shown by a red dot and red lettering (matching the surface water monitoring points) rather than by the blue dot and black lettering used for the other seeps and springs; and
3. Under the Description of Map Units, the arrangement of these units in the Legend is confusing. The Price River Formation units (Kpb and Kpm) are out of stratigraphic sequence: the Price River units should be between the Flagstaff and North Horn (TKfn) and Castlegate (Kc) units. The relationship between Upper Mudstone Member of the Kenilworth Member of the Blackhawk Formation (Kbk) and the Upper Member of the Sunnyside Member of the Blackhawk Formation (Kbs) is reversed: the Sunnyside Member should be above the Kenilworth Member.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Diversions: General

Cross sections 2+00, 3+00, and 4+00 on Plates 5-7A-1 and 5-7A-2 have been corrected to show the location of ditch DD-10, between the road and parking area on the disturbed side and Lila Wash on the undisturbed side.

Stream Buffer Zones

Surface disturbance will only take place along Lila Canyon Wash (Plate 5-2), a wash with ephemeral flow that is intermittent by the definition in the Utah Coal Mining Rules because it drains an area of over one mi^2; and the Right Fork of Lila Wash, an ephemeral wash (Section 724.200 - Permit Area Surface Water Resources). The Permittee has delineated buffer zones

along Lila Canyon Wash (Appendix 7-3; Plates 5-2 and 7-2). Buffer Zone markers will mark the limits of mining activity adjacent to Lila Canyon Wash (Section 731.600). There will be no diversion of this wash (Section 742.320) and no runoff from the disturbed area will enter this drainage (Section 731; Plate 7-2). There is no surface disturbance planned along Stinky Springs Wash or Little Park Wash and its tributaries (Plate 5-2).

Based on information in the MRP-Part B, the Division finds that the planned coal-mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources in Lila Canyon Wash. The Division authorizes the Permittee to conduct the coal-mining and reclamation activities described in the MRP within 100 feet of Lila Canyon Wash.

Findings:

Hydrologic Information in the Operation Plan is sufficient to meet the requirements of the Coal Mining Rules.

RECOMMENDATIONS:

This amendment cannot be approved for inclusion in the MRP until the deficiencies have been addressed to meet the requirements of the Coal Mining Rules.

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